

# To Find Out Prevalence of Urinary Tract Infection in Cerebral Palsy Patients

ASMA ANWAR<sup>1</sup> SHAFQA AZIZ<sup>2</sup>, SUMAIRA NAVEED<sup>3</sup>, FOUZIA ISHAQ<sup>4</sup>, NAVEED AKBAR<sup>5</sup>, MARIA IFTHIKHAR<sup>6</sup>

<sup>1</sup>Assistant Professor of Pediatrics Fatima Jinnah Medical University Lahore.

<sup>2</sup>Senior Registrar Mayo Hospital Lahore.

<sup>3</sup>Associate Professor of Pediatrics Services Institute of Medical Sciences Lahore.

<sup>4</sup>Associate Professor of Pediatrics Fatima Jinnah Medical University Lahore.

<sup>5</sup>Associate Professor of Pediatrics Fatima Jinnah Medical University Lahore.

<sup>6</sup>Senior Registrar Department of Pediatrics Sir Ganga Ram Hospital Lahore.

Correspondence to: Dr. Asma Anwar, Email: drasmaamer@hotmail.com

## ABSTRACT

**Background:** Urinary Tract Infection (UTI) in cerebral palsy is a common clinical condition. Children with cerebral palsy have the increased probability of getting UTI. They have incomplete bladder emptying and urinary retention due to abnormal neuromotor control of bladder.

**Aim:** To determine the prevalence of UTI in children with cerebral palsy.

**Method:** It was a Cross Sectional Study conducted in the department of Pediatrics Sir Ganga Ram Hospital, Lahore from 21<sup>st</sup> May 2019 till November 2019. A total of 100 cases fulfilling the inclusion/ exclusion criteria were enrolled from the outpatient and inpatient department of pediatrics, Sir Ganga Ram Hospital Lahore. Informed consent was obtained to include their data in the study. Demographic Profile was also taken. Urine samples were taken and sent to the hospital laboratory for diagnosis of urinary tract infection. UTI was recorded.

**Results:** Mean age of children was 7.683.09 years. Gender distribution of patients showed that there were 61(61%) male and 39(39%) female children. There were 33(33%) children who were malnourished. There were 34(34%) children who suffered from urinary tract infection. No statistically significant association was seen between urinary tract infection with age, gender & socioeconomic status however it was significantly associated with nutritional status of the children.

**Conclusion:** As per findings of this study children with cerebral palsy has occurrence of urinary tract infection as high as 34%. So it is important to also screen these children for urine examination as a baseline investigation in all the cerebral palsy patients presenting to hospital (both indoor and outdoor departments) and also regular follow up after every 6 months to minimize the complications faced by these children other than cerebral palsy.

**Keywords:** Urinary Tract Infection (UTI), Children, Cerebral palsy, Nutritional status, socioeconomic status

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## INTRODUCTION

Cerebral palsy patients have diverse group of gross motor dysfunctions<sup>1</sup>. It is a global problem. In developed countries it has a prevalence of 2-2.5/1000 live births. One of the more troublesome and deadly complications in patients with cerebral palsy is urinary tract infection<sup>2</sup>. This population has increased susceptibility to bacterial invasion and thus increased chance of infection<sup>3</sup>.

A single episode of urinary tract infection can lead to renal scarring which may lead to high blood pressure and end stage renal disease even.

The factors contributing to increase chance of getting infection of urinary tract are poor bladder and bowel control, physical impairment, intellectual disability, difficulty in control of posture, difficulty in conveying the need to empty the bladder, constipation and abnormal bladder function<sup>4</sup>. In the developed world the thrust of urinary tract infection in cerebral palsy patient varies from 8.5 to 56.7%. Whereas in Africa (Nigeria) particularly the commonness was found to be 38.5%<sup>5-9</sup>. The E. coli, Proteus, Enterococcus faecalis, Klebsiella specie, Staphylococcus spp are common pathogens. Amoxicillin and Cotrimoxazole are the recommended drugs. However, there are reports of resistance to these drugs<sup>10</sup>.

Children with cerebral palsy are often started with initial antibiotics for therapy of urinary tract infection without definite diagnosis. They often receive antibiotics for the problems like pneumonias secondary to aspiration etc<sup>11-12</sup>.

Thus the development of antibiotic resistant strains is a major concern which put these patients at risk of gathering antibiotic resistant organisms.

Starting patients with medication without confirming the diagnosis puts financial burden on families which in most of cases are poor.

The rationale of this study is to see prevalence of urinary tract infection in children with cerebral palsy. Cerebral palsy patients are more prone to urinary tract infection because of limited ambulation. In developed countries special adaptive equipment's such as walkers, poles, standing frames and electronic wheel chairs are available to help in ambulation of cerebral palsy children. However in underdeveloped countries like Pakistan such facilities are lacking which limits mobility and hence increases the susceptibility to urinary tract infection. Furthermore no local study is published regarding urinary tract infection in cerebral palsy patients and we found an international study reported 38.5% prevalence of Urinary tract infection<sup>13</sup>. This study is imperative to conduct for our pediatric population to see the prevalence of urinary tract infection. This study highlights the potential complications that can result from missed and untreated urinary tract infections in children as many cerebral palsy patients in our

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Received on 17-11-2019

Accepted on 27-04-2020

setup receive more attention in treatment of fits. In case a higher frequency of urinary tract infection is found in cerebral palsy patients in this study then guidelines have to be formed incorporating urine examination as a baseline investigation in all the cerebral palsy patients presenting to hospital 9 indoor and outdoor departments) and also regular follow up after every 6 months.

## MATERIAL AND METHODS

This study was done in the department of pediatrics, Sir Ganga ram hospital from 21st may till Nov 2019. A total of 100 cases fulfilling the inclusion/exclusion criteria, were enrolled from the outpatient and inpatient department of pediatrics, Sir Ganga Ram Hospital Lahore. Patient of either gender between 2-12 were enrolled. Informed consent was taken. Demographic profile (name, age, sex, contact number) was also taken. Urine samples were taken and sent to hospital laboratory for diagnosis of urinary tract infection was recorded on a pre-designed attached Performa.

SPSS version 20 was used to enter and analyze the data. Qualitative data like gender, urinary tract infection, nutritional status, socioeconomic status was presented in form of percentage(%). The quantitative data like age was presented in form of mean  $\pm$  S.D. Data was stratified for age, gender, nutritional status, and socioeconomic status to deal with effective modifiers. Post stratification Chi square test was applied. p-value <0.05 was considered significant.

## RESULTS

Mean age of children was 7.683.09 years. Minimum and maximum age of children was 2 and 12 years.

Gender distribution of patients showed that there were 61(61%) male and 39(39%) female children.(Table-2) Among the included children there were 62(62%) children who belong to low class and 38(38%) belong to middle class.

There were 33(33%) children who were malnourished while 34(34%) children suffered from urinary tract infection. Among children suffering from urinary tract infection 6(17.6%) were in the age group 2-4, 10(29.4%) in the age group 5-7, 10(29.4%) in the age group 8-10 and 8(23.5%) were in the age group more than 10 years. However, children in the age groups 5-7 and 8-10 years had the highest frequency of urinary tract infection but no statistically significant association was seen between age of children and urinary tract infection. i.e. (p-value=0.729) (Table-I)

Children who suffered from urinary tract infection among them 23(67.6%) were male and 11(32.4%) were females. Although frequency of urinary tract infection was high among male but no statistically significant association was seen between gender and UTI. i.e. (p-value=0.328) (Table-II)

It was observed that children who belong to lower class among them frequency of urinary tract infection was higher as compared to those children who belonged to middle class socioeconomic status. Low socioeconomic status: 73.5% vs. Middle socioeconomic status: 26.5%. (p-value=0.088)(Table-III)

Children who had urinary tract infection among them 26(76.5%) were malnourished. A statistically significant association was seen between nutritional status of children and p value=0.000) (Table-IV) tract infection that is middle class. (Table-III) There were 33(33%) children who were malnourished. (Table-IV)

Table - I Urinary Tract Infection & Age Of Children

Age Groups	UTI		Total
	Yes	No	
2-4	6(17.6%)	14(21.2%)	20
5-7	10(29.4%)	13(19.7%)	23
8-10	10(29.4%)	20(30.3%)	30
>10	8(23.5%)	19(28.8%)	27
Total	34	66	100

Chi-Square Test = 1.299 P-Value = 0.729

Table – II: Urinary Tract Infection & Gender Of Children

Gender	UTI		Total
	Yes	No	
Male	23(67.6%)	38(57.6%)	61
Female	11(32.4%)	28(42.4%)	39
Total	34	66	100

Chi-Square Test = 0.957 P-Value = 0.328

Table III: Urinary Tract Infection & Socioeconomic Status

Socioeconomic Status	UTI		Total
	Yes	No	
Low	25(73.5%)	37(56.1%)	62
Middle	9(26.5%)	29(43.9%)	38
Total	34	66	100

Chi-Square Test = 2.90 P-Value = 0.088

Table – IV: Urinary Tract Infection & Nutritional Status Of Children

Malnourished	UTI		Total
	Yes	No	
Yes	26(76.5%)	7(10.6%)	33
No	8(23.5%)	59(89.4%)	67
Total	34	66	100

Chi-Square Test = 44.02 P-Value = 0.000

## DISCUSSION

In this study 34 patients (34%) were having urinary tract infection. Among these children the highest frequency was observed in children in the age group of 5-7 to 8-10 years that is 29.4% in both groups followed by 23.5% in children aged 10 years and 17.6% in children aged 2-4 years. Between male infants the UTI was higher compared to female infants. Children of low social and economic status had a high frequency of UTI. UTI in the lower socioeconomic status: 73.5% compared to high socioeconomic status: 26.5% respectively, but the child nutritional status was significantly associated with UTI in CP children. The frequency of UTIs was significantly higher among malnourished children. Authors from developed countries report an increase of 2.2-32.5% of urinary tract infections among patients with cerebral palsy<sup>13,16</sup>. The frequency of UTI among CP children lies within reported limits from developed countries. i.e. 34%.

Emmanuel Adémólá Anígilájé in his study reported the prevalence of UTI in CP children as 38.5% and among these children only severe motor dysfunction predicted UTI risk (OR = 54.81, 95% CI, 227132400 P value 0.014)<sup>14</sup>.

This study however showed a small percentage of UTI in CP children but rounded the frequency as reported by Emmanuel Adémolá Anigilájé.

The current study can be compared to the 32.5% reported by Ozturk et al, in Turkey, but is much higher than the 7.4% and 2.2% relevant reported by Reid and Borzyskowski in London and Hellquist et al. in North Carolina<sup>19</sup>. Jose Ailton Fernandes Silva of Brazil has examined urodynamic findings and possible kidney injury in children with cerebral palsy and urinary problems. Symptoms that led to the test were urinary tract infections in 21 cases (56.7%)<sup>15</sup>. These are children who are often transported from one place to another by their siblings or parents because of the difficulty of mobility and both wheelchair-operated or electric wheelchairs are often away from these families. Often, these children are not properly attended and, kept in one place for a long time, most of them develop pressure sores on the occiputs and buttocks and poor hygiene caused by prolonged fecal soiling can increase the risk of UTI. UTIs may develop more easily following urinary retention due to difficulty in getting to the toilets to micturate in a few potential urinary continents. Related to poor drinking habits and the possible risk of kidney stones could put these children at UTI<sup>14</sup>.

Although in an estimated one-third of patients with cerebral palsy, the dysfunction is prevalent, few studies have documented urodynamic findings and urinary tract problems in children with cerebral palsy. It is important to consider the bladder malfunction in any child with cerebral palsy that shows low urinary tract symptoms<sup>15-17</sup>.

## CONCLUSION

As per findings of this study frequency of urinary tract infection in children with cerebral palsy is high i.e. 34%. So it is important to also screen these children for urine examination as a baseline investigation in all the cerebral palsy patients presenting to hospital (both indoor and outdoor departments) and also regular follow up after every 6 months to minimize the complications faced by these children other than cerebral palsy.

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